

July 19

WHAT IS CLAIMED IS:

1. A polishing apparatus comprising:
a polishing unit for polishing a workpiece;
at least three cleaning units for cleaning polished workpieces; and
a transfer robot for transferring said polished workpieces between said at least three cleaning units, said transfer robot being capable of changing transfer routes between said at least three cleaning units.
2. A polishing apparatus according to claim 1, wherein said polishing unit comprises
~~a table having a polishing surface, and a top ring for holding the workpiece and pressing the workpiece against said polishing surface to polish the workpiece.~~
3. A polishing apparatus according to claim 1, wherein said at least three cleaning units are capable of cleaning said polished workpieces in at least three-stages.
4. A polishing apparatus according to claim 1, wherein said transfer robot is capable of transferring said polished workpieces between said cleaning units along two parallel transfer routes, and said at least three cleaning units are capable of cleaning said polished workpiece in at least two-stages.
5. A polishing apparatus according to claim 1, wherein at least one of said cleaning units has a spin-drying function to dry said clean polished workpieces by spinning said clean polished workpieces.
6. A polishing apparatus according to claim 1, wherein said transfer structure comprises a plurality of robots.
7. A polishing apparatus comprising:

a polishing unit for polishing a workpiece;
at least three cleaning units for cleaning/polished workpieces; and
at least two robots for transferring said polished workpieces between said at least three cleaning units, said at least two robots being capable of changing transfer routes between said at least three cleaning units.

8. A polishing apparatus according to claim 7, wherein said polishing unit comprises a table having a polishing surface, and a top ring for holding the workpiece and pressing the workpiece against said polishing surface to polish the workpiece.

9. A polishing apparatus according to claim 7, wherein said at least three cleaning units are capable of cleaning said polished workpieces in at least three-stages.

10. A polishing apparatus according to claim 7, wherein said at least two robots are capable of transferring said polished workpieces between said cleaning units along two parallel transfer routes, and said at least three cleaning units are capable of cleaning said polished workpieces in at least two-stages.

11. A polishing apparatus according to claim 7, wherein at least two of said cleaning units have a spin-drying function to dry said clean polished workpieces by spinning said clean polished workpieces.

12. A polishing apparatus comprising:
a loading/unloading unit for supplying a workpiece to be polished and receiving a polished and cleaned workpiece;
a polishing unit for polishing a workpiece;
at least three cleaning units for cleaning polished workpieces, at least two of said three cleaning units having an identical cleaning function; and
a transfer robot for transferring the workpieces.

13. A polishing apparatus according to claim 12, wherein said polishing unit comprises a table having a polishing surface, and a top ring for holding the workpiece and pressing the workpiece against said polishing surface to polish the workpiece.

14. A polishing apparatus according to claim 12, further comprising a transfer robot, one of said robots having two grippers for transferring workpieces to and from a cassette placed in said loading/unloading unit.

15. A polishing apparatus according to claim 12, further comprising a transfer robot, at least one of said robots having two grippers which are vertically spaced from each other as a dry finger for holding the dry workpiece and a wet finger for holding the wet workpiece.

16. A polishing apparatus according to claim 12, wherein at least two of said cleaning units are capable of cleaning both surfaces of the workpiece.

17. A polishing apparatus comprising:
a polishing unit for polishing a workpiece;
four cleaning units for cleaning polished workpieces at plural stages; and
a transfer robot for transferring said polished workpiece from said polishing unit to a first cleaning unit of said four cleaning units.

18. A polishing apparatus according to claim 17, further comprising another transfer robot for transferring said polished workpiece between at least two of said cleaning units.

19. A polishing apparatus according to claim 17, wherein said polishing unit comprises a table having a polishing surface and a top ring for holding the workpiece against said polishing surface to polish the workpiece.

20. A polishing apparatus according to claim 19, further comprising a pusher for

transferring the workpiece to and receiving the workpiece from said top ring.

21. A polishing apparatus comprising:

a polishing unit for polishing a workpiece; and

a plurality of cleaning units for cleaning polished workpieces at plural stages;

wherein both surfaces of the workpiece are scrubbed in one of said cleaning units.

22. A polishing apparatus comprising:

a loading/unloading unit for storing workpieces to be polished and workpieces which have been polished and then cleaned,

a polishing section comprising a plurality of tables each for polishing a workpiece;

a plurality of cleaning units for cleaning polished workpieces at plural stages;

a first transfer robot for transferring the workpiece from said polishing section to a first cleaning unit of said plural cleaning units, and

a second transfer robot for transferring the workpiece between said loading/unloading unit and said cleaning units.

23. A polishing apparatus comprising:

a polishing unit for polishing a workpiece;

a cleaning unit for cleaning a polished workpiece;

a loading/unloading unit for loading and unloading the workpiece;

wherein said polishing unit is positioned at one end of said polishing apparatus, and said loading/unloading unit is positioned at the other end of said polishing apparatus, and said cleaning unit is disposed in a space between said polishing unit and said loading/unloading unit.

24. A polishing apparatus according to claim 23, further comprising a transfer robot for transferring the workpiece in said polishing apparatus, and said transfer robot is disposed in said space.

25. A polishing apparatus according to claim 23, further comprising a reversing unit disposed in a space between said polishing unit and said loading/unloading unit for turning over the workpiece.

26. A polishing apparatus according to claim 23, wherein said polishing unit comprises a table having a polishing surface, and a top ring for holding the workpiece and pressing the workpiece against said polishing surface to polish the workpiece.

27. A polishing apparatus according to claim 23, further comprising a dressing member for dressing a polishing cloth attached to an upper surface of said table.

28. A polishing apparatus according to claim 23, wherein a plurality of cleaning units are provided in said space.

29. A polishing apparatus according to claim 23, wherein a plurality of wafer storage cassettes are provided in said loading/unloading unit

30. A polishing apparatus according to claim 23, wherein said cleaning unit comprises rollers for scrubbing both surfaces of the workpiece.

31. A polishing apparatus according to claim 23, wherein at said cleaning unit, the workpiece is held at its edge and rotated.

32. A polishing apparatus comprising:

a polishing unit for polishing a workpiece, said polishing unit being positioned at one end of said polishing apparatus;

a loading/unloading unit for loading and unloading the workpiece, said loading/unloading unit being positioned at the other end of said polishing apparatus;

a cleaning unit for cleaning a polished workpiece, said cleaning unit being disposed in a

space between said polishing unit and said loading/unloading unit; and

a pusher provided in said polishing unit, for transferring a workpiece to be polished and receiving said polished workpiece.

33. A polishing apparatus according to claim 32, further comprising a transfer robot for transferring the workpiece to said pusher in said polishing apparatus, said transfer robot being disposed in said space.

34. A polishing apparatus according to claim 32, further comprising a reversing unit disposed in a space between said polishing unit and said loading/unloading unit for turning over the workpiece.

35. A polishing apparatus according to claim 32, wherein said polishing unit comprises a table having a polishing surface, and a top ring for holding the workpiece against said turntable.

36. A polishing apparatus according to claim 35, wherein the workpiece is transferred between said pusher and said top ring.

37. A polishing apparatus according to claim 32, wherein a plurality of cleaning units are provided in said space .

38. A polishing apparatus according to claim 32, wherein a plurality of wafer storage cassettes are provided in said loading/unloading unit.

39. A polishing apparatus according to claim 32, wherein said cleaning unit comprises rollers for scrubbing both surfaces of the workpiece.

40. A polishing apparatus according to claim 32, wherein at said cleaning unit, the workpiece is held at its edge and rotated.

41. A polishing apparatus according to claim 32, further comprising a dressing member for dressing a polishing cloth attached to an upper surface of said table.
42. A polishing apparatus comprising:
a polishing unit for polishing a workpiece; and
a cleaning section comprising two cleaning units for cleaning a polished workpiece twice;
wherein one of said cleaning units cleans both surfaces of the workpiece, and the other of said cleaning units comprises a drying unit for drying the workpiece.
43. A polishing apparatus according to claim 42, wherein said one cleaning unit comprises a sponge for scrubbing both surfaces of the workpiece.
44. A polishing apparatus according to claim 42, wherein at said the other cleaning unit, a cleaning liquid is supplied to the workpiece.
45. A polishing apparatus according to claim 42, wherein said drying unit dries the workpiece by spin-drying.
46. A polishing apparatus according to claim 42, wherein at said the other cleaning unit, an edge of the workpiece is held and the workpiece is rotated.
47. A polishing method comprising:
polishing primarily a workpiece;
scrubbing the workpiece; and
polishing secondarily the workpiece.
48. A polishing method according to claim 47, wherein said primary polishing and said secondary polishing are conducted at different polishing surfaces.

49. A polishing method according to claim 47, further comprising transferring the workpiece by a transfer robot from a position of said primary polishing to a position of said scrubbing, and a position of said secondary polishing.

50. A polishing apparatus comprising:

a first polishing unit for polishing primarily a workpiece;

a cleaning unit for scrubbing a polished workpiece; and

a second polishing unit for polishing secondarily the polished and scrubbed workpiece.

51. A polishing apparatus according to claim 50, further comprising a transfer robot for transferring the workpiece from a position of said primary polishing to a position of said scrubbing, and a position of said secondary polishing.